

# Course Syllabus



## ENV H 433: Environmental & Occupational Sampling and Analysis - Microbial Contaminants

Winter Quarter, 2022

MWF 8:30-10:20 AM

### INSTRUCTOR

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### TEACHING ASSISTANTS

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### COURSE LOCATION:

First week will be held online via zoom:

<https://washington.zoom.us/j/95475631287?pwd=bm8yYXBzaUFQblc3R0dUYzg3UUkwQT09>

<https://washington.zoom.us/j/95475631287?pwd=bm8yYXBzaUFQblc3R0dUYzg3UUkwQT09>)

Meeting ID: 954 7563 1287

Passcode: 475725

Starting January 10th, class will be held in person in HSB T-369/375.

### COURSE DESCRIPTION

This course will review the sampling and analysis of microbiological contaminants in water, air, and on surfaces. Topics covered will include legal considerations, sampling and experimental design, routes of exposure, sources of exposure, standard methods, QA/QC, and data management. This course will be of use for public health professionals, microbiologists, civil and environmental engineers, and environmental scientists.

### COURSE OBJECTIVES:

At the conclusion of this class, students should be able to:

- Recognize the various microbial contaminants in environment/occupational settings and rationale for sampling
- Distinguish between the methods for sample collection/processing in different environment/occupational settings
- Explain the advantages/disadvantages of using indicator bacteria in environment/occupational settings
- Display appropriate chemical and bio-safety laboratory precautions
- Describe the importance of quality assurance/quality control [QA/QC] procedures
- Analyze and manage scientific data
- Interpret legal/regulatory frameworks microbial sampling
- Write a basic research protocol

## TEXTS AND REFERENCES

There is no required text for this course. Assigned readings and course materials will be available on the course webpage. [\\_ \(https://www.epa.gov/sites/production/files/2015-10/documents/rec-factsheet-2012.pdf\)](https://www.epa.gov/sites/production/files/2015-10/documents/rec-factsheet-2012.pdf)

## COURSE DESIGN:

The course will begin with lectures via zoom during week one. From week two on, classes will be held in-person. Students must be in the classroom and ready to go before class starts at 8:30 AM. Six laboratory experiments will be covered. Each experiment will begin with a short lecture on day one. Students should come prepared to conduct the labs based on the provided experimental protocols/papers. The final exam will be online and due by 11:59 pm **Thursday March 17, 2022**. Once the final exam is started, you will have 2 hours to complete it.

## GRADING

- **Online Safety Trainings (20%)**: Students will be responsible for completing two online safety trainings available on the UW EH&S Website: Biosafety Training-Online and Managing Laboratory Chemicals-Online. These must be completed prior to starting work in the laboratory on January 10th.
- **Laboratory Notebooks and Write-Ups (50%)**: Students are responsible for maintaining a lab notebook. Students should have instructor or TA sign off on lab book at the conclusion of each laboratory. After each experiment is completed for labs 1-5, students will be responsible for individual write-ups addressing questions provided. These should be short (2-3 pages) and will be due the next class period after the lab is complete.
- **DNA Extraction and qPCR Protocol Development (10%)**: Laboratory 6 will demonstrate DNA extraction and qPCR. Students will be individually responsible for developing a written protocol for these methods based on the laboratory demonstration. The protocols will be due by 11:59 pm Thursday March 17, 2022.
- **Final Exam (20%)**: Online, open book/notes. The final exam will due by 11:59 pm Thursday March 17, 2022. Once the final exam is started, you will have 2 hours to complete it.

Grades will be assigned according to the scale below.

%      Gradepoint

>95%    4

94      3.9

93      3.8

92      3.7

91      3.6

90      3.5

89      3.4

88      3.3

87      3.2

86      3.1

85      3

84      2.9

83      2.8

82      2.7

81      2.6

80      2.5

79      2.4

78	2.3
77	2.2
76	2.1
75	2
74	1.9
73	1.8
72	1.7
71	1.6
70	1.5
69	1.4
68	1.3
67	1.2
66	1.1
65	1

## Late assignment policy

It is essential that assignments are turned in on time to facilitate grading in a timely manner. Late assignments without prior approval may be penalized 10% per class period late.

## Student responsibilities

Students are expected to arrive on time and be ready to start right at 8:30 AM. This is critical. Attendance will be taken.

If students must miss a class due to illness, the instructors should be notified as soon as possible. Students should notify instructors of any other absence to discuss possibility of make up work.

Students are expected to come to class prepared (keep up with the readings).

It is absolutely essential that students adhere to appropriate lab safety practices, failure to adhere to safety practices will result in immediate stop of lab practices for the day.

Above all, ask questions.

## IMPORTANT CLASS POLICIES

### Communication Skills

Communication through writing and speaking is an important transferable skill for all career pathways. Establishing a strong foundation in communication skills will help you be successful throughout your future course work and career. Therefore, this course includes assignments with the goal to help you identify areas of strength and improvement in your communication. If you feel that you could benefit from additional opportunities to improve your writing skills in particular, a list of resources at the UW and others accessible online can be found on the SPH website

at <https://sph.washington.edu/sites/default/files/inline-files/Writing-Resources-4.3.19.pdf>  
(<https://sph.washington.edu/sites/default/files/inline-files/Writing-Resources-4.3.19.pdf>).

## Important Policies & Resources

### Academic Integrity

Students at the University of Washington (UW) are expected to maintain the highest standards of academic conduct, professional honesty, and personal integrity.

The UW School of Public Health (SPH) is committed to upholding standards of academic integrity consistent with the academic and professional communities of which it is a part. Plagiarism, cheating, and other misconduct are serious violations of the University of Washington [Student Conduct Code \(WAC 478-121\)](https://apps.leg.wa.gov/WAC/default.aspx?cite=478-121) (<https://apps.leg.wa.gov/WAC/default.aspx?cite=478-121>). We expect you to know and follow the university's policies on cheating and plagiarism, and the [SPH Academic Integrity Policy](https://sph.washington.edu/students/academic-integrity-policy) (<https://sph.washington.edu/students/academic-integrity-policy>). Any suspected cases of academic misconduct will be handled according to University of Washington regulations. For more information, see the University of Washington [Community Standards and Student Conduct](https://www.washington.edu/cssc/) (<https://www.washington.edu/cssc/>).

### Access and Accommodations

Your experience in this class is important to me. It is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law. If you have already established accommodations with Disability Resources for Students (DRS), please activate your accommodations via myDRS so we can discuss how they will be implemented in this course.

If you have not yet established services through DRS, but have a temporary health condition or permanent disability that requires accommodations (conditions include but not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), contact DRS directly to set up an Access Plan. DRS facilitates the interactive process that establishes reasonable accommodations. Contact DRS at [disability.uw.edu](https://uwnetid-my.sharepoint.com/personal/brittama_uw_edu/Documents/disability.uw.edu) [\\_\(https://uwnetid-my.sharepoint.com/personal/brittama\\_uw\\_edu/Documents/disability.uw.edu\)](https://uwnetid-my.sharepoint.com/personal/brittama_uw_edu/Documents/disability.uw.edu).

## Religious Accommodations

Washington state law requires that UW develop a policy for accommodation of student absences or significant hardship due to reasons of faith or conscience, or for organized religious activities. The UW's policy, including more information about how to request an accommodation, is available at [Religious Accommodations Policy \(https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/\)](https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/) [\\_\(https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/\)](https://registrar.washington.edu/staffandfaculty/religious-accommodations-policy/). Accommodations must be requested within the first two weeks of this course using the [Religious Accommodations Request form \(https://registrar.washington.edu/students/religious-accommodations-request/\)](https://registrar.washington.edu/students/religious-accommodations-request/) [\(https://registrar.washington.edu/students/religious-accommodations-request/\)](https://registrar.washington.edu/students/religious-accommodations-request/).

## Inclusion & Diversity

Diverse backgrounds, embodiments and experiences are essential to the critical thinking endeavor at the heart of University education. In SPH, we are expected:

1. To respect individual differences, which may include, but are not limited to, age, cultural background, disability, ethnicity, family status, gender, immigration status, national origin, race, religion, sex, sexual orientation, socioeconomic status and veteran status.
2. To engage respectfully in the discussion of diverse worldviews and ideologies embedded in course readings, presentations and artifacts, including those course materials that are at odds with personal beliefs and values.
3. To encourage students with concerns about classroom climate to talk to their instructor, adviser, a member of the departmental or SPH EDI Committee, the Assistant Dean for EDI, or the program's director.

## Classroom Climate

We are co-creators of our learning environment. It is our collective responsibility to develop a supportive learning environment for everyone. Listening with respect and an open mind, striving to understand others' views, and articulating your own point of view will help foster the creation of this environment. We engage our differences with the intent to build community, not to put down the other and distance our self from the other. Being mindful to not monopolize discussion and/or interrupt others will also help foster a dialogic environment.

**The following guidelines can add to the richness of our discussion:**

- We assume that persons are always doing the best that they can, including the persons in this learning environment.
- We acknowledge that systematic oppression exists based on privileged positions and specific to race, gender, class, religion, sexual orientation, and other social variables and identities.
- We posit that assigning blame to persons in socially marginal positions is counter-productive to our practice. We can learn much about the dominant culture by looking at how it constructs the lives of those on its social margins.
- While we may question or take issue with another class member's ideology, we will not demean, devalue, or attempt to humiliate another person based on her/his experiences, value system, or construction of meaning.
- We have a professional obligation to actively challenge myths and stereotypes about our own groups and other groups so we can break down the walls that prohibit group cooperation and growth. [Adapted from Lynn Weber Cannon (1990). Fostering positive race, class and gender dynamics in the classroom. *Women Studies Quarterly*, 1 & 2, 126-134.]

We are a learning community. As such, we are expected to engage with difference. Part of functioning as a learning community is to engage in dialogue in respectful ways that supports learning for all of us and that holds us accountable to each other. Our learning community asks us to trust and take risks in being vulnerable.

**Here are some guidelines that we try to use in our learning process:**

- LISTEN WELL and be present to each member of our group and class.
- Assume that I might miss things others see and see things others miss.
- Raise my views in such a way that I encourage others to raise theirs.
- Inquire into others' views while inviting them to inquire into mine.
- Extend the same listening to others I would wish them to extend to me.
- Surface my feelings in such a way that I make it easier for others to surface theirs.
- Regard my views as a perspective onto the world, not the world itself.
- Beware of either-or thinking.
- Beware of my assumptions of others and their motivations.
- Test my assumptions about how and why people say or do things.
- Be authentic in my engagement with all members of our class.

## Pronouns

We share our pronouns because we strive to cultivate an inclusive environment where people of all genders feel safe and respected. We cannot assume we know someone's gender just by looking at them. So we invite everyone to share their pronouns.

## Bias Concerns

The Office of the Dean has a [student concern policy](https://sph.washington.edu/students/student-concern-policy), a faculty concern policy and standard HR procedures for staff concerns. Our 2018 climate survey states that most people in SPH do not report bias incidents because they do not know where to go. Students are encouraged to report any incidents of bias to someone they feel comfortable with, including instructors, advisers or department staff. They can email [dcinfo@uw.edu](mailto:dcinfo@uw.edu) for immediate follow up. Bias concerns can be anonymously and confidentially reported at this link <https://sph.washington.edu/about/diversity/bias-concerns>. Data is collected by the Assistant Dean for EDI and the Director of Program Operations for Student and Academic Services and tracked for resolution and areas are identified for further training.

## Sexual Harassment

Sexual harassment is a form of harassment based on the recipient's sex that is characterized by:

1. Unwelcome sexual advances, requests for sexual favors, or other verbal or physical conduct of a sexual nature by a person who has authority over the recipient when:
  - Submission to such conduct is an implicit or explicit condition of the individual's employment, academic status, or ability to use University facilities and services, or
  - Submission to or rejection of the conduct affects tangible aspects of the individual's employment, academic status, or use of University facilities.
2. Unwelcome and unsolicited language or conduct that creates an intimidating, hostile, or offensive working or learning environment, or has the purpose or effect of unreasonably interfering with an individual's academic or work performance.

If you believe that you are being harassed, or have observed harassment, you can report it to SPH using the [bias concerns link](https://sph.washington.edu/about/diversity/bias-concerns). The University also has designated offices to help you: [SafeCampus](https://www.washington.edu/safecampus/); [Office of the Ombud](https://www.washington.edu/ombud/); [Title IX Investigation Office](https://www.washington.edu/titleix/report/); and [University Complaint Investigation and Resolution Office](https://www.washington.edu/compliance/uciro/).

## COURSE SCHEDULE

For a complete, session-by-session course schedule, please see [the Modules Page](#).

Date	Topic	Location
Jan 3	Introduction/overview, Lab safety	Zoom
Jan 5	Sterile technique, Microbiology review, Sampling & experimental design	Zoom
Jan 7	QA/QC and regulations	Zoom
Jan 10, 12, 14	Lab 1: MPN multiple tube fermentation, Colilert [yes/no]	HSB T-369/375
Jan 17	<b>HOLIDAY - Martin Luther King Day</b>	No class
Jan 19, 21	Lab 1: MPN multiple tube fermentation, Colilert [yes/no] continued	HSB T-369/375
Jan 24, 26, 28, 31	Lab 2: IDEXX and membrane filtration to detect enterococci/ <i>E. coli</i> . Jan 24: Lab 1 write-up due	HSB T-369/375
Feb 2, 4, 7, 9, 11	Lab 3: Surface sampling for <i>S. aureus</i> and methicillin-resistant <i>S. aureus</i> (MRSA). Feb 2: Lab 2 write-up due	HSB T-369/375 Feb 11: No in-person class
Feb 14, 16, 18	Lab 4: <i>Salmonella</i> in chicken. Feb 14: Lab 3 write-up due	HSB T-369/375
Feb 21	<b>HOLIDAY - Presidents' Day</b>	No class
Feb 23, 25	Lab 5: Airborne Microbial contaminants. Feb 23: Lab 4 write-up due	HSB T-369/375
Feb 28, Mar 2, 4,	Lab 6: DNA extraction & qPCR	Zoom

7, 9, 11	Feb 28: Lab 5 write-up due	Mar 4 & 11: No in-person class
Mar 14-17	<b>Final Exam - Open Book/Notes</b> Mar 17: Lab 6 protocols due	Online